Critical and Creative Thinking in the Higher-Education Classroom

Eric Mazur: "Why you can pass tests and still fail in the real world"

Today, assessment “focuses on the regurgitation of memorized information…instead of developing 21st-century skills, all we’re really doing is using assessment to rank and classify students.”

https://www.youtube.com/watch?v=P3X0i8W-c3l
Carol Dweck: “Growth vs Fixed Mindset”

“Students (especially beginning ones) are attentive (sometimes anxious, even frustrated) when there’s the possibility of more than one answer to a question. Which one is correct? Which one will get me credit on the exam?”

http://www.facultyfocus.com/articles/teaching-professor-blog/relationship-participationdiscussion/?ET=facultyfocus:e137.253698a&dest=email#rhash=dxwG2JH7_dnuF

Ken Robinson: “How schools kill creativity”

“By the time [kids] become adults…they’re afraid of making mistakes. We stigmatize mistakes. We are now running a national education system in which mistakes are the worst things you can make….The result is that we are educating people out of their creative capacity.”

http://www.ted.com/talks/ken_robinson_says_schools_kill_creativity?language=en
What is critical thinking?

Universal Structures of Thought

- Whenever we think
- we think for a purpose
- within a point of view
- based on assumptions
- leading to implications and consequences.
- We use data, facts and experiences
- to make inferences and judgments
- based on concepts and theories
- to answer a question or solve a problem.

We do these things unconsciously

Universal Structures of Thought

- What is my fundamental purpose?
- What is my point of view with respect to the issue?
- What assumptions am I using in my reasoning?
- What are the implications of my reasoning (if I am correct)?
- What information do I need in order to answer my question?
- What are my most fundamental inferences or conclusions?
- What is the most basic concept in the question?
- What is the key question I am trying to answer?

We need to do these things more deliberately

The Critical Thinking Foundation: www.criticalthinking.org
How do we go about teaching students to improve their thinking?

- Build critical thinking into course objectives and student-learning outcomes
- Design activities and assessments that focus on the new objectives and outcomes
- Change our instructional style to match our assessment style
How can we redesign our student-learning outcomes to encourage critical thinking?

What might these student-learning outcomes look like?

Critical Thinking Learning Outcomes

- **Describe** patterns or relationships in large amounts of written and/or visual information.
- **Evaluate** information, evidence and argument for reliability and authority/usefulness (e.g., observation, testimony, measurement, experiment).
- **Identify and manage** the risks associated with making and implementing decisions.

Critical Thinking Learning Outcomes

- **Analyze and assess** the strength of an argument and the implications for a course of action that follows from it.

- **Access or generate** alternatives and select the most appropriate.

- **Develop** a clearly articulated argument to support a view and use it to justify one or more conclusions.

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Critical Thinking Learning Outcomes

- **Analyze** a conflict and draw relationships with historical examples.

- **Generate** critical questions about historical examples.

- **Reflect on** the strength and weaknesses of yourself and your team members and suggest ways in which you and others could improve the work of the team in the future.
Critical Thinking Learning Outcomes

- **Select and discuss** information to produce different ways of viewing a problem.
- **Determine** the component parts of a problem/issue, their relationships to each other and to the issue/problem as a whole.
- **Develop** a rationale for performing a character in a particular way.

What kinds of activities and assessments best teach critical thinking?

How can they be achieved using the Universal Design for Learning Immersion Experience?
Types of Assignments and Assessments

• Essays
• Group exams
• Oral exams
• Debates
• Graded discussions
• Academic poster sessions
• Self-reflections (perhaps responding to specific prompts)
• Group or individual projects
• Presentations to the greater community

A Sample Assignment to do in class

• Students, in groups of four, choose the best paper, then join with a second group and choose the best of the two.

• This last paper is read to the class as a whole and a class-wide discussion is held about the strengths and weakness of the papers chosen, leading to the class voting on the best paper of the day

Try using SEEI to replace the multiple choice test

- **State the concept (in a single sentence)**
- **Elaborate on it (“In other words,...”)**
- **Exemplify it (“For example,...”)**
- **Illustrate it (provide a metaphor, analogy, or whatever might do the same work as a picture in a book: “It's like...”)**

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Take Advantage of Rubrics

- remove some of the ambiguity and subjectivity associated with open-ended questions
- force us to articulate what we’re looking for as we assess student work
- make the task of grading higher-order thinking exercises more manageable
### Rubrics can simply be checklists

<table>
<thead>
<tr>
<th>Purpose:</th>
<th>Does the student demonstrate a clear understanding of the assignment’s purpose?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Question, Problem, or Issue:</td>
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### Try integrating instructional design into your teaching

- **Move away from focusing solely on conveying material**
- **Establish deliberate connections between student-learning outcomes, assignments, and assessments**
- **Infuse your course with opportunities for critical thinking**

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Web Resources on Critical Thinking

- [http://www.criticalthinking.org](http://www.criticalthinking.org) - The Critical Thinking Community
- [http://www.aacu.org/value/rubrics/critical-thinking](http://www.aacu.org/value/rubrics/critical-thinking) - Rubrics for critical thinking assessments
- [http://course1.winona.edu/shatfield/air/rubrics.htm](http://course1.winona.edu/shatfield/air/rubrics.htm) - A comprehensive list of rubrics for article reviews, case studies, class participation, critical thinking, essays, lab reports, presentations, and much more
- [http://www.pdx.edu/institutional-assessment-council/rubric-examples](http://www.pdx.edu/institutional-assessment-council/rubric-examples) - Portland State University rubric samples
- [http://www.foothill.edu/schedule/docs/CTRubic.pdf](http://www.foothill.edu/schedule/docs/CTRubic.pdf) - Foothill College Critical Thinking Rubric
- [http://rubistar.4teachers.org/index.php](http://rubistar.4teachers.org/index.php) - Rubric-making software
- [http://stephenbrookfield.com/Dr._Stephen_D._Brookfield/Workshop_Materials.html](http://stephenbrookfield.com/Dr._Stephen_D._Brookfield/Workshop_Materials.html) - This whole site offers great tools for critical thinking

For more contact information

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Sally M. Dobyns, UConn ITL
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4 = Thinking is exemplary, skilled, marked by excellence in clarity, accuracy, precision, relevance, depth, breadth, logicality, and fairness
3 = Thinking is competent, effective, accurate and clear, but lacks the exemplary depth, precision, and insight of a 4
2 = Thinking is inconsistent, ineffective; shows a lack of consistent competence: is often unclear, imprecise, inaccurate, and superficial
1 = Thinking is unskilled and insufficient, marked by imprecision, lack of clarity, superficiality, illogicality, and inaccuracy, and unfairness

@Foundation for Critical Thinking, www.criticalthinking.org
# Critical Thinking Worksheet

**Overall Score ________**

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<th>If applicable, score the element (1-4)</th>
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<td><strong>Interpretations, Inferences:</strong> Does the student follow where evidence and reason lead in order to obtain defensible, thoughtful, logical conclusions or solutions? Does the student make deep (rather than superficial) inferences? Are the inferences consistent?</td>
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<td><strong>Implications, Consequences:</strong> Does the student identify the most significant implications and consequences? Does the student distinguish probable from improbable implications?</td>
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